

List of claims:

Claim 1 (previously presented): Process for manufacturing fine iron or steel powders, characterized in the steps of

- providing an iron based, fragmented raw material, finely divided when applicable,
- providing a brittle material by transforming raw material to nitride by means of ammonia gas,
- milling the nitridic material to particle sizes desired, when applicable, and
- denitriding to a fine iron or steel powder.

Claim 2 (previously presented): Process according to claim 1, characterized in that the raw material is chosen from one or more of the material groups

- 1) iron, eg iron powder and/or sponge iron
- 2) iron oxide powder
- 3) steel, eg steel powder and/or turning scrap.

Claim 3 (currently amended): Process according to claim 1 ~~or 2~~ characterized in that the transformation to nitride is carried out at 400-800 C, preferably at 500-700 C.

Claim 4 (currently amended): Process according to claim 1, ~~2, or 3~~, characterized in that the nitrogen content is about 3-20 % by weight, preferably more than 6 % by weight.

Claim 5 (currently amended): Process according to ~~anyone of the preceeding claims~~ claim 1, characterized in that milling (3) is performed by means of milling equipment know per se, eg ball milling equipment or jet milling equipment, for milling materials down to micron sizes.

Claim 6 (currently amended): Process according to ~~anyone of the preceeding claims~~ claim 1, characterized in that milling is performed batchwise or continuously.

Claim 7 (currently amended): Process according to ~~anyone of the preceeding claims~~ claim 1, characterized in that a fraction of powder particles within a desired particle size interval is obtained by separation, eg by sieveing or elutriation techniques in a batchwise or continuous separation procedure (6).

Claim 8 (previously presented): Process according to claim 7, characterized in that milling and separation is performed dry or wet.

Claim 9 (currently amended): Process according to ~~anyone of the preceeding claims~~ claim 1, characterized in that transformation to nitride (2), milling and particle size separation is performed in an integrated process in which too coarse, separated particles are recirculated from the separation step to the transformation step.

Claim 10 (currently amended): Process according to ~~anyone of the preceeding claims~~ claim 1, characterized in that transformation to nitride and milling is performed in an integrated process step (4), eg by providing milling bodies during the transformation in a rotating tube furnace.

Claim 11 (currently amended): Process according to ~~anyone of the preceding claims~~
claim 1, characterized in that denitridding is performed by means of hydrogen gas.

Claim 12 (previously presented): Process according to claim 11, characterized in that
denitridding is performed at 250-400 C, preferably at 300-350 C.

Claim 13 (currently amended): Process according to ~~anyone of the preceding claims~~
claim 1, characterized in that nitride powder is produced as an alloying substance for sintering
purposes.

Claim 14 (currently amended): Process according to ~~anyone of the preceding claims~~
claim 1, characterized in that mean particle sizes of the produced powders are about 1-50um,
preferably about 3-25um.

Claim 15 (previously presented): Plant for manufacturing fine iron or steel powders,
characterized by 'means (2) for containing a fragmented iron based raw material, means for
providing ammonia gas to said raw material for transforming iron of the raw material
substantially totally to nitride, 'milling means (3), when applicable, for milling the nitridic material
to particle sizes desired and 'means (8) for denitridding to a fine iron or steel powder.

Claim 16 (previously presented): Plant according to claim 15, characterized in that said
transformation is intended to occur at about 400-800 C, preferably at about 500-700 C.

Claim 17 (currently amended): Plant according to claim ~~15 or 16~~, characterized in that said transformation is intended to provide a nitrogen content of about 3-20 % by weight, preferably over 6 % by weight.

Claim 18 (currently amended): Plant according to claim ~~15, 16 or 17~~, characterized in that said milling means is milling equipment of a kind known per se, eg ball milling equipment or jet milling equipment for milling materials down to micron sizes.

Claim 19 (currently amended): Plant according to claim ~~15, 16, 17 or 18~~, characterized in that the milling means are arranged for batchwise or continuous milling.

Claim 20 (currently amended): Plant according to claim ~~any of claims 15-19~~ 15, characterized by separation means for obtaining a fraction of powder particles within a desired particle size interval, eg sieving or elutriation means, said separation means being arranged for batchwise or continuous operation.

Claim 21 (currently amended): Plant according to ~~any of claims 15-20~~ claim 15, characterized in that milling and separation is intended to be performed dry or wet.

Claim 22 (currently amended): Plant according to ~~any one of claims 15-21~~ claim 15, characterized in that transformation to nitride, milling and particle size separation is intended to be performed in an integrated process arrangement in which too coarse particles are arranged to be recirculated from a separation operation to a transformation operation.

Claim 23 (currently amended): Plant according to ~~anyone of claims 15-22~~claim 15, characterized by an integrated process step for transformation to nitride and milling, eg a rotating tube furnace provided with milling bodies, during transformation.

Claim 24 (currently amended): Plant according to ~~anyone of claims 15-23~~claim 15, characterized by arrangements for providing hydrogen gas for denitridding the nitride powder.

Claim 25 (currently amended): Plant according to ~~anyone of claims 15-24~~claim 15, characterized in that denitridding is intended to be performed at about 250-400 C, preferably about 300-350 C.

Claim 26 (currently amended): Use of fine iron based nitride powder according to ~~anyone of claims 1-14~~claim 1 as an alloying substance in sintered steel production.

Claim 27 (currently amended): Use according to ~~claim 25~~26, characterized in that mean particle sizes of the powders are about 1-50µm, preferably about 3-25µm.

Claim 28 (currently amended): Use of fine iron or steel powder according to ~~anyone of claims 1-14~~claim 1 as material for metal injection moulding (MIM).

Claim 29. Fine iron or steel powder characterised in that it is produced by the process according to ~~anyone of claims 1-14~~claim 1.